

Appl. No. 09/521,545
Amendment dated August 12, 2003
Reply to Office Action of May 15, 2003

REMARKS

Applicants have received and reviewed an Office Action dated May 15, 2003. By way of response, Applicants have cancelled claims 1-3, 5-9, and 52-59 without prejudice and amended claims 42 and 67. Applicants reserve the right to pursue any cancelled subject matter in one or more continuation or divisional applications. No new matter is presented. Claims 29, 31-51, and 60-74 are pending. Applicants submit that the pending claims are supported by the specification.

Claim 42 and 67 have been amended to correct minor typographical errors, omission of a colon and/or substitution of "can be" for "is".

For the reasons given below, Applicants submit that the pending claims are in condition for allowance and notification to that effect is earnestly solicited.

Priority Claim

Applicants appreciate that the Examiner has acknowledged the claim of priority to the parent application for claims 1, 5, 8-10, 42, 52, 60, and 67.

Parent Application

Applicants respectfully submit that at least several claims dependant from claims 42, 60, and 67, for which the Examiner has acknowledged priority, also merit priority to the parent application.

Applicants respectfully note that claim 5, for which the Examiner acknowledged priority, is nearly identical to presently pending claims 45, 63, and 71. Each of these claims includes a recitation explicitly found in claims 2 and 10 of the parent patent. Further, each of claims 45, 63, and 71 depends from a claim for which the Examiner has acknowledged priority. Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 5, 45, 63, and 71.

Applicants respectfully note that claim 9, for which the Examiner acknowledged priority, is nearly identical to presently pending claims 66 and 74. Each of these claims includes a recitation explicitly found in claims 6 and 14 of the parent patent. Further, each of claims 66 and 74 depends from a claim for which the Examiner has acknowledged priority. Therefore,

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Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 9, 66, and 74.

Applicants note that claims 46, 64, and 72 recite that "the nucleic acid comprises an underivatized nucleic acid." Applicants respectfully submit that the parent application is replete with explicit description of nucleic acids and of derivatized nucleic acids. For example, claim 2 of the parent patent explicitly recites "nucleic acid" and claim 3 explicitly recites a "nucleic acid" including "one or more functional groups". Claim 2 explicitly recites underivatized nucleic acids, and claim 3 explicitly recites derivatized nucleic acids. By way of further example, the summary of the invention in the parent application generally describes nucleic acids and in its last paragraph notes that the present reagents and methods can "also" be used with "derivatized nucleic acids". The parent application expressly distinguishes between derivatized and underivatized nucleic acids. Further, each of claims 46, 64, and 72 depends from a claim for which the Examiner has acknowledged priority. Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 46, 64, and 72.

Applicants note that claims 47, 65, and 73 recite that "the underivatized nucleic acid comprises an oligonucleotide." As described in the previous paragraph, the parent application is replete with explicit description of underivatized nucleic acids. Similarly, Applicants respectfully submit that the parent application is replete with description of oligonucleotides. The section of the parent application headed "TECHNICAL FIELD" explicitly states that the invention "relates to methods for attaching target molecules such as oligonucleotides". Two paragraphs in the summary of the invention in the parent patent expressly describe oligonucleotides (column 4, lines 15-39). A paragraph in the detailed description specifically lists target molecules including "oligonucleotides" (parent patent at least at column 6, lines 32-35). Further, each of claims 47, 65, and 73 ultimately depends from a claim for which the Examiner has acknowledged priority. Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 47, 65, and 73.

Claims 43, 44, 61, 62, 68, and 69 each recite several monomers having a pendant epoxide group. Each of these claims depends from a claim for which the Examiner has acknowledged

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priority to the parent application. The claims for which the Examiner has acknowledged priority each recite "one or more monomers having pendant epoxy group". The dependent claims merely recite examples of the epoxy group described in the parent application. The present invention is not found in the particular monomers having a pendant epoxide group, but rather resides in the reagent compositions including copolymers including monomers having pendant epoxy group. The particular monomers are known reagents. Thus, upon reading the parent patent application, a worker skilled in the art would necessarily envision the epoxy groups recited in claims 43, 44, 61, 62, 68, and 69. Therefore, these claims appropriately claim priority to the parent application. Applicants respectfully request that the Examiner acknowledge this priority claim.

Claims Reciting Diepoxide

Claim 33, from which claims 34-41 depend, recites reagent compositions including a polymer formed by reacting a mixture including diepoxide. The Examiner has already acknowledged that claims reciting "one or more monomers having pendant epoxy group" merit priority to the parent application. Claim 33 merely recites a particular type of monomer having pendant epoxy group. The present invention is not found in the particular monomers having a pendant epoxide group, but rather resides in the reagent compositions including copolymers including monomers having pendant epoxy group. Diepoxides are known as monomers having pendant epoxide group. Thus, upon reading the parent patent application, a worker skilled in the art would necessarily envision the diepoxide recited in claim 33. Therefore, this claim appropriately claims priority to the parent application. Applicants respectfully request that the Examiner acknowledge this priority claim.

Dependent claims 34, 35, and 37-41 include recitations discussed previously and also merit priority to the parent application. Dependent claim 36 recites particular diepoxides. This claim merits priority to the parent application for reasons analogous to those advanced for claims 33, 43, 44, 61, 62, 68, and 69. Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 34, 35, and 37-41.

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Claims Reciting Ranges of Ingredients

Presently pending claims 29-32 and 48-51 relate to ranges for the amounts of the one or more monomers having pendant epoxy group and the one or more monomers having a photoreactive group. A monomer having a pendant epoxy group can be considered a monomer with a pendant thermochemically reactive group. The parent patent application explicitly discloses at Examples 9-13 a variety of amounts of monomers having photoreactive groups and monomers having pendant thermochemically reactive groups. These amounts fall within and support the ranges included in presently pending claims 29-32 and 48-51.

Priority for other features of these claims has been discussed previously.

Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the parent application for each of claims 29-32 and 48-51.

The Grandparent Application

Applicants respectfully submit that the logic that the Examiner employed to support the priority claim to the parent application also supports the priority claim to the grandparent application.

To ease the Examiner's burden, Applicants will start by discussing the independent claims for which the Examiner has acknowledged priority to the parent application. Applicants will respectfully direct the Examiner's attention to portions of the grandparent application that provide support equal to that of the parent application. In fact, very similar or identical text can be found in the parent and grandparent applications.

Independent Claims 42, 60, and 67

Each of presently pending independent claims 42, 60, and 67 relates to a reagent composition for attaching a molecule to the surface of a substrate, the reagent composition including a copolymer. Applicants respectfully submit that the grandparent application is replete with explicit description of such reagent compositions and copolymers. For example, the grandparent patent in the section headed "SUMMARY OF THE INVENTION" explicitly states that the reagent can include "one or more hydrophilic polymers, to which the thermochemically reactive, attractive and/or photoreactive groups can be pendant" (column 2, lines 66, through

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column 3, line 1). The first paragraph under the heading "DETAILED DESCRIPTION" provides similar explicit description and describes the polymer as a backbone. At least at column 5, lines 19-27, the grandparent patent explicitly describes that the polymeric backbone can be made of a copolymer. Therefore, the grandparent application specifically describes the recitation found in presently pending independent claims 42, 60, and 67 of a reagent composition for attaching a molecule to the surface of a substrate, the reagent composition including a copolymer.

Each of presently pending independent claims 42, 60, and 67 recites that the copolymer includes one or more pendant epoxy groups and/or is made from one or more monomers having pendant epoxy group. Such an epoxy group can be viewed as, and is explicitly described in the grandparent patent as, a thermochemically reactive group that is pendant from the polymeric backbone. The grandparent patent explicitly describes at least at column 7, lines 29-34, that an epoxide can serve as the thermochemically reactive group. In addition, the grandparent patent explicitly describes at least at column 7, lines 51-54, that the polymer can be made from monomers "having a polymerizable group at one end of the molecule" and a "thermochemically reactive group at the other end". Therefore, the grandparent application specifically describes the recitation found in presently pending independent claims 42, 60, and 67 of a polymer including one or more pendant epoxy groups and/or made from one or more monomers having pendant epoxy group.

Each of presently pending independent claims 42, 60, and 67 recites that the copolymer also includes one or more diluent monomers or polymers, which include acrylics, vinyls, nylons, polyurethanes, or polyethers. Applicants respectfully submit that the grandparent application is replete with explicit description of such monomers or polymers and including acrylics, vinyls, nylons, polyurethanes, or polyethers. First, at least at column 5, lines 28-35, the grandparent patent explicitly describes monomers including acrylics, vinyls, nylons, polyurethanes, and a polyether, polyethylene oxide. Second, discussing copolymers, the grandparent patent explicitly describes that "functionalized monomers are used at relatively global percentages of the total monomer content of polymerization reaction with the remainder of the composition consisting of a monomer which is neither photoreactive nor thermochemically reactive" (at least at column 8, lines 20-25). Therefore, the grandparent application specifically describes the recitation found in

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presently pending independent claims 42, 60, and 67 of a copolymer including one or more diluent monomers or polymers, which include acrylics, vinyls, nylons, polyurethanes, or polyethers.

Each of presently pending independent claims 42, 60, and 67 recites that the copolymer also includes one or more monomers including photoreactive group or one or more photoreactive aryl ketones. Applicants respectfully submit that the grandparent application is replete with explicit description of copolymers including such monomers. For example, monomers including photoreactive groups are explicitly described in the grandparent patent at least at column 5, line 49, through column 7, line 18. Photoreactive aryl ketones are explicitly described in the grandparent patent at least at column 6, lines 11-36. Therefore, the grandparent application specifically describes the recitation found in presently pending independent claims 42, 60, and 67 of a copolymer including one or more monomers including photoreactive group or one or more photoreactive aryl ketones.

Each of presently pending independent claims 42, 60, and 67 recites that the copolymer can be attached to the surface of the substrate by formation of a covalent bond and the epoxy group can form a covalent bond with the nucleic acid or target molecule. Applicants respectfully submit that the grandparent application is replete with explicit description of such copolymers. See, for example, the Abstract and/or the first two paragraphs of the Summary of the Invention of the grandparent application. Therefore, the grandparent application specifically describes the recitation found in presently pending independent claims 42, 60, and 67 of a copolymer that can be attached to the surface of the substrate by formation of a covalent bond and the epoxy group can form a covalent bond with the nucleic acid or target molecule.

Accordingly, Applicants respectfully request that the Examiner acknowledge the priority claim to the grandparent application for each of independent claims 42, 60, and 67.

Dependent Claims 46, 64, and 72

Applicants note that claims 46, 64, and 72 recite that "the nucleic acid comprises an underivatized nucleic acid." Applicants respectfully submit that the grandparent application is replete with description of nucleic acids and of derivatized nucleic acids. For example, claim 4 of the grandparent patent recites "nucleic acid" and claim 7 recites a "nucleic acid" including

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"one or more functional groups". Claim 4 explicitly recites underivatized nucleic acids, and claim 7 explicitly recites derivatized nucleic acids. By way of further example, the summary of the invention in the grandparent application generally discusses nucleic acids and in its last paragraph notes that the present reagents and methods can "also" be used with "derivatized nucleic acids". The grandparent application expressly distinguishes between derivatized and underivatized nucleic acids. Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the grandparent application for each of claims 46, 64, and 72.

Dependent Claims 47, 65, and 73

Applicants note that claims 47, 65, and 73 recite that "the underivatized nucleic acid comprises an oligonucleotide." As described in the previous paragraph, the grandparent application is replete with description of underivatized nucleic acids. Similarly, Applicants respectfully submit that the grandparent application is replete with description of oligonucleotides. The section of the grandparent application headed "TECHNICAL FIELD" indicates that the invention "relates to methods for attaching target molecules such as oligonucleotides". Three paragraphs in the summary of the invention in the grandparent patent specifically mention oligonucleotides (column 3, lines 1-39). A paragraph in the detailed description specifically lists target molecules including "oligos" (grandparent patent at least at column 5, lines 1-5). Therefore, Applicants respectfully request that the Examiner acknowledge the priority claim to the grandparent application for each of claims 47, 65, and 73.

Dependent Claims 43, 44, 61, 62, 68, and 69

Claims 43, 44, 61, 62, 68, and 69 each recite several monomers having a pendant epoxide group. These dependent claims merely recite examples of the epoxy group described in the grandparent application. The present invention is not found in the particular monomers having a pendant epoxide group, but rather resides in the reagent compositions including copolymers including monomers having pendant epoxy group. The particular monomers are known reagents. Thus, upon reading the grandparent patent application, a worker skilled in the art would necessarily envision the epoxy groups recited in claims 43, 44, 61, 62, 68, and 69.

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Therefore, these claims appropriately claim priority to the grandparent application. Applicants respectfully request that the Examiner acknowledge this priority claim.

Dependent Claims 45, 63, and 71

Claims 45, 63, and 71 each recite several specific types of surfaces. The dependent claims merely recite examples of the surfaces generally described in the parent and grandparent applications. The present invention is not found in the particular types of surfaces, but rather resides in the reagent compositions including copolymers including monomers having pendant epoxy group and which can be coupled to such a surface. The particular surfaces are known. Thus, upon reading the parent or grandparent patent applications, a worker skilled in the art would necessarily envision the types of surfaces recited in claims 45, 63, and 71. Therefore, these claims appropriately claim priority to the grandparent application. Applicants respectfully request that the Examiner acknowledge this priority claim.

Claims Reciting Diepoxide

Claim 33, from which claims 34-41 depend, recites reagent compositions including a polymer formed by reacting a mixture including diepoxide. The Examiner has already acknowledged that claims reciting "one or more monomers having pendant epoxy group" merit priority to the parent application. As described above, the grandparent application also adequately describes the subject matter of "one or more monomers having pendant epoxy group". Claim 33 merely recites a particular type of monomers having pendant epoxy group. The present invention is not found in the particular monomers having a pendant epoxide group, but rather resides in the reagent compositions including copolymers including monomers having pendant epoxy group. Diepoxides are known as monomers having dependent epoxide group. Thus, upon reading the grandparent patent application, a worker skilled in the art would necessarily envision the diepoxide recited in claim 33. Therefore, this claim appropriately claims priority to the parent application. Applicants respectfully request that the Examiner acknowledge this priority claim.

Dependent claims 34, 35, and 37-41 include recitations discussed previously and also merit priority to the grandparent application. Dependent claim 36 recites particular diepoxides.

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This claim merits priority to the grandparent application for reasons analogous to those advanced for claims 33, 43, 44, 61, 62, 68, and 69.

Claims Reciting Ranges of Ingredients

Presently pending claims 29-32 and 48-51 relate to ranges for the amounts of the one or more monomers having pendant epoxy group and the one or more monomers having a photoreactive group. A monomer having a pendant epoxy group can be considered a monomer with a pendant thermochemically reactive group. The grandparent patent application discloses at Examples 9-13 a variety of amounts of monomers having photoreactive groups and monomers having pendant thermochemically reactive groups. These amounts fall within and support the ranges included in presently pending claims 29-32 and 48-51.

Priority for other features of these claims has been discussed previously.

Prior Art Rejections Over Duran Reference

The Examiner rejected claims 1, 5, 8-10, 42, 48, 50, 52, 60 and 67 under 35 U.S.C. § 103(a) as being obvious over Duran et al. (U.S. Patent No. 5,858,653) and Shi et al. (U.S. Patent No. 5,919,626). The Examiner rejected claims 1, 5, 8-10, 33-42, 48, 50, 52, 60 and 67 under 35 U.S.C. § 103(a) as being obvious over Duran et al. and an asserted admission at page 13 of the present application. The Examiner rejected claims 1-3, 5-9, 29, 31-32 and 42-74 under 35 U.S.C. § 103(a) as being obvious over Duran et al. and Shi et al. and further in view of Kalal et al. (U.S. Patent No. 4,332,694). Applicants respectfully traverse these rejections.

Claims 1-10 and 52-59 have been canceled, which renders these rejections moot for these claims.

With respect to the other pending claims, Applicants respectfully submit that the present rejection must be withdrawn because the Duran et al. reference is not properly considered prior art against the present claims. First, as discussed above, the present claims properly claim priority to the application leading to the Duran et al. patent. Second, the Duran et al. reference is not eligible to be employed as prior art according to 35 U.S.C. § 103(c).

The Duran et al. reference is a U.S. patent with a filing date of September 30, 1997 and an issue date of January 12, 1999. It appears that the Examiner has considered this reference

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prior art under § 102(e). The rejections note the filing date of the Duran et al. reference. Further, this reference qualifies as prior art only under § 102(e).

A reference that is prior art only under § 102(e) cannot be used, according to § 103(c), in an obviousness rejection if the subject matter of the cited reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. A clear statement of entitlement to the prior art exclusion by Applicants or a registered practitioner is a sufficient evidence to establish the prior art exclusion (Examination Guidelines for 35 U.S.C. § 102(e) (as amended and revised) at IV(5); 1266 TMOG 80, January 14, 2003).

Applicants hereby make a clear statement of entitlement to exclude the Duran et al. reference as prior art as provided by § 103(c). The Duran et al. patent is assigned to the assignee of the present patent application. The Duran et al. patent and the present patent application were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Therefore, the Duran et al. reference is not properly considered prior art against the presently claimed invention and these rejections are rendered moot. Withdrawal of these rejections is respectfully requested.

The Duran et al. Reference Does Support an Obviousness Rejection of the Presently Claims

The present application claims priority to the Duran et al. reference for all subject matter disclosed in the Duran et al. reference. Thus, any subject matter of the Duran et al. reference employed in a rejection is subject matter to which the present application properly claims priority, and that subject matter is ineffective as prior art with respect to the present application. The secondary references do not remedy the shortcomings of the Duran et al. reference.

Accordingly, the Duran et al. reference, either alone or in combination, does not teach or suggest the presently claimed invention.

Obviousness-Type Double Patenting Rejections

The Examiner rejected claims 1, 5, 8-10, 42, 52, 60 and 67 under the judicially created doctrine of obviousness-type double patenting as obvious over claims 1-16 of U.S. Patent No.

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6,465,178. The Examiner rejected claims 33-41 under the judicially created doctrine of obviousness-type double patenting as obvious over claims 1-16 of U.S. Patent No. 6,465,178. Applicants respectfully traverse these rejections.

Claims 1-10 and 52 have been canceled, which renders this rejection moot for these claims.

Applicants believe that the present claims are not properly rejected under the judicially created doctrine of obviousness-type double patenting. Should such a rejection remain pending when the claims are otherwise in condition for allowance, Applicants will provide a terminal disclaimer, if appropriate.

Prior Art Rejections Over Kalal Reference

Kalal and Kalal Plus Shi

The Examiner rejected claims 1-3, 5-8, and 52-57 under 35 U.S.C. § 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Kalal et al. The Examiner rejected claims 1-3, 5-8, and 52-57 under 35 U.S.C. § 103(a) as obvious over Kalal et al. and Shi et al. Applicants respectfully traverse these rejections.

Further, each of the claims subject to these rejections have been canceled, which renders these rejections moot.

Accordingly, withdrawal of these rejections is respectfully requested.

Kalal Plus Shi in View of Swanson

The Examiner rejected claims 1-3, 5-9, 29, 31-32, and 42-74 under 35 U.S.C. § 103(a) as obvious over Kalal et al. and Shi et al. and further in view of Swanson et al. (U.S. Patent No. 5,942,555). Applicants respectfully traverse this rejection.

Claims 1-10 and 52-59 have been canceled, which renders this rejection moot for these claims.

Applicants note that application of the Kalal et al. and Shi et al. references to pending claims 29, 31, 32, 42-51, and 60-74 requires that the Swanson et al. reference form the basis of the rejection. According to the Office Action, without the Swanson et al. reference, the Kalal et

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al. and Shi et al. references were sufficient to reject only claims 1-3, 5-8, and 52-57, which have been canceled. Without the Swanson et al. reference, this rejection falls.

The Swanson et al. reference is not prior art against claims of the present application. In addition, the Swanson et al. reference, either alone or in combination, neither teaches nor suggests the presently claimed invention.

The Swanson et al. Reference is Not Prior Art

The Swanson et al. reference is a U.S. patent with a filing date of March 21, 1996 and an issue date of August 24, 1999. It appears that the Examiner has considered this reference prior art under § 102(e). The rejections note the filing date of the Swanson et al. reference. Further, this reference qualifies as prior art only under § 102(e).

A reference that is prior art only under § 102(e) cannot be used, according to § 103(c), in an obviousness rejection if the subject matter of the cited reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. A clear statement of entitlement to the prior art exclusion by Applicants or a registered practitioner is a sufficient evidence to establish the prior art exclusion (Examination Guidelines for 35 U.S.C. § 102(e) (as amended and revised) at IV(5); 1266 TMOG 80, January 14, 2003).

Applicants hereby make a clear statement of entitlement to exclude the Swanson et al. reference as prior art as provided by § 103(c). The Swanson et al. patent is assigned to the assignee of the present patent application. The Swanson et al. patent and the present patent application were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Therefore, the Swanson et al. reference is not properly considered prior art against the presently claimed invention and these rejections are rendered moot. Withdrawal of this rejection is respectfully requested.

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The Swanson et al. Reference Neither Teaches Nor Suggests the Presently Claimed Invention

Applicants also maintain the arguments presented in the previous responses that the Swanson et al., either alone or in combination, neither teaches nor suggests the presently claimed invention.

Conclusion

Accordingly, based on the foregoing differences, it is submitted that the references cited by the Examiner neither teach nor suggest the presently claimed reagent compositions, and withdrawal of this rejection is respectfully requested.

Summary

In summary, Applicants submit that each of claims 29, 31-51, and 60-74 are in condition for allowance. The Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below, if the Examiner believes that doing so will expedite prosecution of this application.

Respectfully submitted,

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Dated: Aug 12, 2003

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